IFW AF #4 1761

PATENT
Attorney Docket No. 202531/PALL

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:

PELZ et al.

Application No. 09/402,721

Art Unit: 1761

Examiner: Curtis E. Sherrer

Filed: December 29, 1999

For: METHOD FOR PRODUCING BEER

TRANSMITTAL OF
APPELLANTS' APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In accordance with 37 CFR 1.192, appellants hereby submit Appellants' Brief on Appeal in triplicate.

The items checked below are appropriate:

1. Status of Appellants

This application is on behalf of ☒ other than a small entity or ☐ a small entity.

2. Fee for Filing Brief on Appeal

Pursuant to 37 CFR 1.17(c), the fee for filing the Brief on Appeal is for: ☒ other than a small entity or ☐ a small entity.

Brief Fee Due $330.00

3. Oral Hearing

☐ Appellants request an oral hearing in accordance with 37 CFR 1.194.

4. Extension of Time

☐ Appellants petition for a one-month extension of time under 37 CFR 1.136, the fee for which is $110.00.

☒ Appellants believe that no extension of time is required. However, this conditional petition is being made to provide for the possibility that

appellants have inadvertently overlooked the need for a petition and fee for extension of time.

Extension fee due with this request: $

5. Total Fee Due

The total fee due is:

Brief on Appeal Fee	$330.00
Request for Oral Hearing	$ 0.00
Extension Fee (if any)	$ 0.00

Total Fee Due: $330.00

6. Fee Payment

☐ Attached is a check in the sum of $.
☒ Charge Account No. 12-1216 the sum of $330.00. A duplicate of this transmittal is attached.

7. Fee Deficiency

☒ If any additional fee is required in connection with this communication, charge Account No. 12-1216. A duplicate copy of this transmittal is attached.

Respectfully submitted,

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Date: 23 Apr. 2004

PATENT
Attorney Docket No. 202531/PALL

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: PELZ et al.

Application No.: 09/402,721 Group Art Unit: 1761

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For: METHOD FOR PRODUCING BEER

APPELLANTS' APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In support of the appeal from the final rejection dated December 9, 2003, Appellants now submit their Brief on Appeal. A Notice of Appeal was filed on March 8, 2004.

Real party in interest

The real party in interest is the Assignee, Pall Corporation.

Related appeals and interferences

None.

Status of Claims

As filed with a preliminary amendment the application contained claims 1-5, 7-18, 20-22, and 24-42. During prosecution, claims 2, 34, and 35 were cancelled so that claims 1, 3-5, 7-18, 20-22, 24-33, and 36-42 are pending in the application. Claims 1, 3-5, 7-18, 20-22, 24-33, and 36-42 are finally rejected. The rejection of claims 1, 3-5, 7-18, 20-22, 24-33, and 36-42 is appealed and those claims appear in the Appendix.

Status of Amendments

All of the preceding claim amendments were entered.

Summary of Invention

The present invention pertains to embodiments of methods for producing beer comprising filtering beer through a porous membrane until the membrane needs cleaning, and cleaning the membrane.

In one embodiment, a method for producing beer comprises (a) filtering beer through a porous membrane until such time that the porous membrane is in need of cleaning, (b) contacting the porous membrane with an enzyme selected from the group consisting of cellulases, amylases, and combinations thereof in the absence of any other enzymes to clean the porous membrane, and (c) then reusing the porous membrane to continue filtering beer.

In another embodiment, a method for producing beer comprises (a) filtering beer through a porous membrane until such time that the porous membrane is in need of cleaning, (b) contacting the porous membrane with a cellulase having a crystalline:soluble cellulase activity ratio at 60 minutes of at least about 0.1 to clean the porous membrane, and (c) then reusing the porous membrane to continue filtering beer.

In yet another embodiment, a method for producing beer comprises (a) filtering beer through a porous membrane that progressively clogs during filtration, (b) monitoring the streaming potential or zeta potential of the porous membrane as a measure of the extent of clogging of the porous membrane, (c) halting filtration of the beer through the porous membrane before the porous membrane becomes fully clogged as determined by the streaming potential or zeta potential of the porous membrane, (d) cleaning the porous membrane, and (e) then reusing the porous membrane to continue filtering beer.

Embodiments of the present invention address a need in the art for an improved method for producing beer, wherein the beer can be filtered through a membrane that can be satisfactorily cleaned and reused.

Issues

The issues on appeal are:

1. Whether the invention defined by appealed claims 4, 5, 7-18, 20-22, 24-33, and 36-42 was indefinite under 35 U.S.C. § 112, second paragraph, in view of the use of the term "about."

2. Whether the invention defined by appealed claims 1, 3-5, 7-15, 18, 20-22, 27, 28, 31, 33, and 37-42 would have been obvious under 35 U.S.C. § 103 to one of ordinary skill in the art in view of Japanese Patent No. 4267933 to Fuji Photo Film Co. Ltd. (hereinafter referred to as "Fuji") in view of Appellants' alleged admissions on pages 1-3 of the instant application.

3. Whether the invention defined by appealed claims 16-17, 24, and 25 would have been obvious under 35 U.S.C. § 103(a) to one of ordinary skill in the art in view of Fuji in view

of Appellants' alleged admissions on pages 1-3 of the instant application and further in view of Japanese Patent No. 52122281 to Ebara Infilco KK (hereinafter referred to as "Ebara").

4. Whether the invention defined by appealed claims 26, 29, 30, 32, and 36 would have been obvious under 35 U.S.C. § 103(a) to one of ordinary skill in the art in view of Fuji in view of Appellants' alleged admissions on pages 1-3 of the instant application and further in view of an article in the *Journal of Colloid and Interface Science* by Bolay *et al.* (hereinafter referred to as "Bolay").

Grouping of Claims

For the purposes of this appeal, there are 7 groups of claims to be given separate consideration. These claims do not stand or fall together.

The first group of claims (Group I) consists of independent claim 1, and dependent claim 3.

The second group of claims (Group II) consists of independent claim 4, and dependent claims 5, 7-15, 18, 20-22, 27, 31, 33, and 37-42.

The third group of claims (Group III) consists of dependent claims 16, 17, 24, and 25.

The fourth group of claims (Group IV) consists of dependent claims 26 and 28.

The fifth group of claims (Group V) consists of independent claim 29, and dependent claim 30.

The sixth group of claims (Group VI) consists of dependent claim 32.

The seventh group of claims (Group VII) consists of dependent claim 36.

Argument

The Rejection under 35 U.S.C. § 112, Second Paragraph

According to the Office Action mailed June 17, 2003, the "scope of the term 'about' is unknown." According to the Office Action mailed December 9, 2003, the term "about" with respect to the crystalline:solubility cellulase activity ratio is limited to those values found in the tables of the specification, and no guidance has been provided with respect to the term "about" in combination with the pore size.

According to well-established case law, claims employing the term "about" have been found to be definite. *See, for example, Modine Mfg. Co. v. U.S. Intern. Trade Comm'n,* 37 USPQ2d 1609, 1615 (Fed. Cir. 1996) *cert. denied sub nom. Showa Aluminum Corp. v. Modine Mfg. Co.*, 518 U.S. 1005 (1996) ("[a]though it is rarely feasible to attach a precise limit to 'about' the usage can usually be understood in light of the technology embodied in the invention") and *Pall Corp. v. Micron Separations, Inc.* 36 USPQ2d 1225, 1229 (Fed. Cir. 1995)

cert. denied, 117 S. Ct. 1243 (1997) ("[t]he use of the word 'about,' avoids a strict numerical boundary to the specified parameter. Its range must be interpreted in its technologic and stylistic context.").

The position set forth in the June 17, 2003 Office Action appears to be that "about" is acceptable when the "technology is like that [ ] discussed in *Modine*" and, because the technology embodied in the present application was not stated in the previous response, *Modine* is not clearly "relevant" case law.

However, the case law is not limited to a technology that is the same as that in *Modine*. One of ordinary skill in the art reading the claims in light of the instant specification would understand the scope of the term "about" as used in the field of the present invention. *See, Modine* at 1617: "[m]athematical precision should not be imposed for its own sake; a patentee has the right to claim the invention in terms that would be understood by persons of skill in the field of the invention." *See also*, MPEP § 2173.05(b), "[a]cceptability of the claim language depends on whether one of ordinary skill in the art would understand what is claimed, in light of the specification."

One of ordinary skill in the art reading the present application has a knowledge of enzymes, and an understanding of the crystalline:soluble cellulase activity ratio. Furthermore, the present application provides guidelines with numerous examples. Accordingly, one of ordinary skill in the art reading the present application, which includes reviewing the scores of data points in the specification, see, for example, page 5, lines 30-33, and the Examples, e.g., including Tables 1, 2, 3, 4, and, in particular, Example 8, that includes Table 6, would understand the scope of the term "about" as used in the claims with respect to the crystalline:soluble cellulase activity ratio.

Similarly, with respect to pore ratings, one of ordinary skill in the art reading the present application has a knowledge of membranes used in filtration. Furthermore, the present application provides guidelines, e.g., at page 6, lines 16-22 (*see also*, Examples 1 and 9), describing suitable porous membranes and ranges of pore ratings.

Accordingly, since one of ordinary skill in the art reading the claims in light of the instant specification would understand the scope of the term "about" as used in the field of the present invention, it is submitted the rejection is improper.

The Group I Claims

The Group I claims, claims 1 and 3, were rejected under 35 U.S.C. § 103 as unpatentable over Fuji in view of Appellants' alleged admissions on pages 1-3 of the instant application.

Neither Fuji nor Appellants (i.e., in the background section at pages 1-3 of the present specification) taken alone or in combination, disclose or suggest a method for producing beer including filtering beer through a porous membrane until such time that the porous membrane is in need of cleaning, contacting the porous membrane with an enzyme selected from the group consisting of cellulases, amylases and combinations thereof in the absence of any other enzymes to clean the porous membrane, and reusing the porous membrane to continue filtering beer.

As used in Fuji (referring to the pages in the English translation), the term "enzyme" can include more than one enzyme (as "a washing solution, a solution containing proteinase and cellulase is used to wash the separation membrane" (emphasis added), page 2, lines 3-4). While Fuji indicates "the enzyme included in the cleaning solution being proteinase or cellulase or both" (page 2, line 15 of text), there is no suggestion anywhere in Fuji that any other enzymes are excluded, or that proteinase should be excluded when filtering beer. Both of the Examples (page 5 of the translation) include proteinase (excluded from the scope of pending claim 1), and Example 2, that refers to beer, discloses proteinase and glucanase, both of which are excluded from the scope of pending claim 1.

The background section of the present application (pages 1-3) merely discloses that to prolong the life of a filter, manufacturers of membrane filters recommend cleaning the used membranes by treating them with proteases, glucanases, and xylanases, as well as with chemicals such as surfactants, acids/bases, and oxidizing agents to make them reusable (see e.g., page 2, lines 6-11). There is no suggestion in the background section of a method for producing beer including filtering beer through a porous membrane until such time that the porous membrane is in need of cleaning, contacting the porous membrane with an enzyme selected from the group consisting of cellulases, amylases and combinations thereof in the absence of any other enzyme to clean the porous membrane, and reusing the porous membrane to continue filtering beer.

Accordingly, even assuming arguendo that one or ordinary skill in the art could be led from Fuji to the background section of the present specification, the combination would not lead one of ordinary skill in the art to the claimed invention.

The Group II Claims

The Group II claims, claims 4, 5, 7-15, 18, 20-22, 27, 31, 33, and 37-42, were rejected under 35 U.S.C. § 103 as unpatentable over Fuji in view of Appellants' alleged admissions on pages 1-3 of the instant application.

The rejection of the Group II claims is essentially the same as the rejection of the Group I claims, and suffers from the same deficiencies as set forth by Appellants above.

The rejection of the Group II claims suffers from additional deficiencies.

The Office Actions have repeatedly asserted that cellulase having a crystalline:soluble cellulase activity ratio at 60 minutes of at least about 0.1 is a parameter that those in the cleaning art would optimize to obtain the best result.

The Office Actions provide absolutely no support for such an assertion in the disclosures of Fuji, in the background section of the present application, or from the Examiner's personal knowledge. There is no reference to the crystalline:soluble cellulase activity in Fuji, or the background section of the present application, or referenced by an Examiner's affidavit or declaration, and thus, in the absence of authority for the assertion in the Office Action, the rejection is improper.

The Office Actions repeatedly (even after an RCE was filed) asserted that Appellants did not seasonably traverse the alleged well known statement during examination, and therefore the object of the well known statement is taken to be admitted prior art. The position set forth in the various Office Actions is not supported by either *In re Chevenard*, 139 F.2d 71, 60 USPQ 239 (CCPA, 1943) or MPEP § 2144.03. The statement is not "well known," and was traversed during examination. While the Examiner was requested to produce authority for the statement, it was never provided. With respect to the MPEP § 2144.03, Appellants submit the "Procedure for Relying on Common Knowledge or Taking Official Notice" sets out, under headings A, B, C, and D, when the procedure is permissible, and it is clear those conditions have not been met here.

There is simply no teaching or suggestion in Fuji and pages 1-3 of the present specification leading one to a method for producing beer including filtering beer through a porous membrane until such time that the porous membrane is in need of cleaning and contacting the porous medium with a cellulase having a crystalline:soluble activity ratio at 60 minutes of at least about 0.1 and then reusing the porous membrane to continue filtering beer.

Accordingly, even assuming arguendo that one or ordinary skill in the art could be led from Fuji to the background section of the present specification, the combination would not lead one of ordinary skill in the art to the claimed invention.

Since the rejection of claims 4, 5, 7-15, 18, 20-22, 27, 33, and 37-42 under 35 U.S.C. § 103 as unpatentable over Fuji in view of Appellants' alleged admissions on pages 1-3 of the instant application is fundamentally defective, the claims are patentable over the reference and alleged admissions.

The Group III Claims

The Group III claims, claims 16, 17, 24, and 25, were rejected under 35 U.S.C. § 103 as unpatentable over Fuji in view of Appellants' alleged admissions on pages 1-3 of the instant application and further in view of Ebara.

The deficiencies of the rejection of independent claim 4 (Group II) have been described in the previous section and are equally applicable here. For example, there is no reference to the crystalline:soluble cellulase activity in Fuji, or the background section of the present application, or referenced by an Examiner's affidavit or declaration. Thus, the rejection is improper.

The rejection of the Group III claims suffers from additional deficiencies.

Ebara is directed to washing impurities from an impermeable diaphragm, and fails to disclose providing a drinkable beverage. In fact, Ebara refers to filtering sewer water (Example 1).

Ebara fails to even mention beer, let alone suggest a method for producing beer including filtering beer through a porous membrane until such time that the porous membrane is in need of cleaning, contacting the porous membrane with an enzyme selected from the group consisting of cellulases, amylases and combinations thereof in the absence of any other enzymes to clean the porous membrane, and reusing the porous membrane to continue filtering beer.

The Office Action states if those in the brewing art had Ebara in front of them, they would have applied the teaching regarding filtering sewer water. Appellants submit that one of ordinary skill in the beer filtering art would not be led to the sewer water filtration art. Moreover, Ebara discloses that, in the washing of impurities from an impermeable diaphragm, the enzyme can be protease or pepsinase, amylase, cellulase, lipase (translation page 3, lines 25-26), and thus teaches that the enzymes can be used interchangeably. The examples refer to alcozyme (Examples 1 and 2) and the enzymatic detergent Biz (Example 2). Thus, even assuming arguendo that one of ordinary skill in the art could be led from Fuji and the background section of the present specification to Ebara, the combination does not lead one of ordinary skill in the art to a method for producing beer including filtering beer through a porous membrane until such time that the porous membrane is in need of cleaning, contacting the porous membrane with an amylase in the absence of any other enzyme to clean the porous membrane and then reusing the porous membrane to continue filtering beer.

The Group IV Claims

The Group IV claim, claims 26 and 28, were rejected under 35 U.S.C. § 103 as unpatentable over Fuji in view of Appellants' alleged admissions on pages 1-3 of the instant application and further in view of Bolay.

The deficiencies of the teachings of Fuji, and the improper basis for the rejection based on Fuji in view the background section of the present application (and/or based upon personal knowledge of the Examiner), have been summarized above, particularly with respect to the Group II claims, and are equally applicable here.

In particular, there is no reference to the crystalline:soluble cellulase activity in Fuji, or the background section of the present application, or referenced by an Examiner's affidavit or declaration. There is simply no teaching or suggestion in Fuji and pages 1-3 of the present specification leading one to a method for producing beer including filtering beer through a porous membrane until such time that the porous membrane is in need of cleaning and contacting the porous medium with a cellulase having a crystalline:soluble activity ratio at 60 minutes of at least about 0.1 and then reusing the porous membrane to continue filtering beer. Moreover, the conditions set forth in MPEP § 2144.03, "Procedure for Relying on Common Knowledge or Taking Official Notice" under headings A, B, C, and D, have not been met.

Thus, the rejection is fundamentally defective.

Bolay fails to refer to producing beer. Additionally, there is no disclosure in Bolay of cleaning membranes. Bolay merely discloses filtering dilute egg protein solutions and following the evolution of the electrical properties of membranes during the fouling process by stream potential measurements.

There is no suggestion in Fuji, Appellants' disclosure, or Bolay, whether taken individually or in combination, of improving upon the Fuji process in the precise manner which yields the claimed invention. Thus, the combination fails to render the claimed invention obvious.

The Group V Claims

The Group V claims, claims 29 and 30, were rejected under 35 U.S.C. § 103 as unpatentable over Fuji in view of Appellants' alleged admissions on pages 1-3 of the instant application and further in view of Bolay.

The deficiencies of the teachings of Fuji, and the improper basis for the rejection based on Fuji in view the background section of the present application, have been summarized above, and are equally applicable here.

The rejection of the Group V claims suffers from additional deficiencies.

Bolay fails to refer to producing beer. Additionally, there is no disclosure in Bolay of cleaning membranes. Bolay merely discloses filtering dilute egg protein solutions and following the evolution of the electrical properties of membranes during the fouling process by stream potential measurements.

Once again, there is no suggestion in Fuji, Appellants' disclosure, or Bolay, whether taken individually or in combination, of improving upon the Fuji process in the precise manner which yields the claimed invention. Put another way, Fuji, the background section of the present specification, and Bolay, whether taken alone or in combination, fail to disclose or suggest a method for producing beer including filtering beer through a porous membrane that progressively clogs during filtration, monitoring the streaming potential or zeta potential of the

porous membrane as a measure of the extent of clogging of the porous membrane, halting filtration of the beer through the porous membrane before the porous membrane becomes fully clogged as determined by the streaming potential or zeta potential of the porous membrane, cleaning the porous membrane, and then reusing the porous membrane to continue filtering beer.

Accordingly, the rejection of the Group V claims is improper, and should be reversed.

The Group VI Claim

The Group VI claim, claim 32, was rejected under 35 U.S.C. § 103 as unpatentable over Fuji in view of Appellants' alleged admissions on pages 1-3 of the instant application and further in view of Bolay.

The deficiencies of the rejection of the Group IV claims (including independent claim 4) have been described in that section and are equally applicable here. In particular, there is no reference to the crystalline:soluble cellulase activity in Fuji, or in the background section of the present application, or in an Examiner's affidavit or declaration. Thus, there is simply no teaching or suggestion in Fuji and pages 1-3 of the present specification leading one to a method for producing beer including filtering beer through a porous membrane until such time that the porous membrane is in need of cleaning and contacting the porous medium with a cellulase having a crystalline:soluble activity ratio at 60 minutes of at least about 0.1 and then reusing the porous membrane to continue filtering beer.

Accordingly, the rejection is fundamentally defective.

Moreover, Bolay fails to refer to crystalline:soluble cellulase activity. Bolay also fails to refer to even one of: producing beer, cleaning membranes and halting filtration when the zeta potential of a porous membrane exceeds -5 mV as measured at pH 4.2. Bolay merely discloses filtering dilute egg protein solutions and following the evolution of the electrical properties of membranes during the fouling process by stream potential measurements.

There is simply no suggestion in Fuji, Appellants' disclosure, or Bolay, whether taken individually or in combination, of improving upon the Fuji process in the precise manner which yields the claimed invention.

Accordingly, the rejection of the Group VI claim is improper, and should be reversed.

The Group VII Claim

The Group VII claim, claim 36, was rejected under 35 U.S.C. § 103 as unpatentable over Fuji in view of Appellants' alleged admissions on pages 1-3 of the instant application and further in view of Bolay.

The deficiencies of the rejection of independent claim 29 (Group V) have been described in that section and are equally applicable here. In particular, Bolay fails to refer to producing beer, and there is no disclosure in Bolay of cleaning membranes.

Additionally, as noted in great detail above during the discussions regarding the Group II claims, the Group IV claims, and the Group VI claims, there is no disclosure of crystalline:soluble cellulase activity in any of Fuji, Appellants' disclosure, and Bolay, and there is no Examiner's affidavit or declaration of record showing crystalline:soluble cellulase activity is well known in the art.

Thus, since there is simply no suggestion in Fuji, Appellants' disclosure, or Bolay, whether taken individually or in combination, of improving upon the Fuji process in the precise manner which yields the claimed invention, the rejection of the Group VII claim is erroneous, and should be reversed.

Conclusion

The subject matter of the appealed claims is neither taught nor suggested by the cited references and Appellant's alleged admissions and is clearly unobvious over the prior art. Accordingly, Appellants respectfully submit that the rejections of the pending claims are improper and should be reversed.

Respectfully submitted,
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Date: 23 April 2004

APPENDIX

1. A method for producing beer comprising:

(a) filtering beer through a porous membrane until such time that the porous membrane is in need of cleaning,

(b) contacting the porous membrane with an enzyme selected from the group consisting of cellulases, amylases, and combinations thereof in the absence of any other enzymes to clean the porous membrane, and

(c) then reusing the porous membrane to continue filtering beer.

3. The method of claim 1, wherein the porous membrane is contacted with the cellulase and no other enzyme.

4. A method for producing beer comprising:

(a) filtering beer through a porous membrane until such time that said porous membrane is in need of cleaning,

(b) contacting the porous membrane with a cellulase having a crystalline:soluble cellulase activity ratio at 60 minutes of at least about 0.1 to clean the porous membrane, and

(c) then reusing the porous membrane to continue filtering beer.

5. The method of claim 4, wherein the porous membrane is contacted with the cellulase and is not contacted with any other enzyme.

7. The method of claim 4, wherein the cellulase has a crystalline:soluble cellulose activity ratio at 60 minutes of at least about 0.3.

8. The method of claim 7, wherein the cellulase has a crystalline:soluble cellulose activity ratio at 60 minutes of at least about 0.4.

9. The method of claim 8, wherein the cellulase has a crystalline:soluble cellulose activity ratio at 60 minutes of at least about 0.5.

10. The method of claim 9, wherein the cellulase has a crystalline:soluble cellulose activity ratio at 60 minutes of at least about 1.

11. The method of claim 10, wherein the cellulase has a crystalline:soluble cellulose activity ratio at 60 minutes of at least about 1.2.

12. The method of claim 4, wherein the cellulase is derived from *Trichoderma*.

13. The method of claim 12, wherein the *Trichoderma* is *Trichoderma reesei* or *Trichoderma longibrachiatum*.

14. The method of claim 4, wherein the cellulase is derived from *Thermomonospora*.

15. The method of claim 14, wherein the *Thermomonospora* is *Thermomonospora fusca*.

16. The method of claim 4, wherein the porous membrane is contacted with an amylase.

17. The method of claim 16, wherein the amylase is selected from the group consisting of α-amylase, β-amylase, and the combination thereof.

18. The method of claim 4, wherein the method further comprises contacting the porous membrane with an aqueous base prior to reusing the porous membrane.

20. The method of claim 18, wherein the aqueous base is an aqueous solution of NaOH and/or KOH.

21. The method of claim 18, wherein the base is present in a concentration of 0.1-1 N in the aqueous base.

22. The method of claim 18, wherein the porous membrane is contacted with the aqueous base at a temperature of 40-90 °C.

24. The method of claim 4, wherein the porous membrane is contacted with α-amylase at a temperature of 60-75 °C and a pH of 4.6-5.8.

25. The method of claim 4, wherein the porous membrane is contacted with β-amylase at a temperature of 40-60 °C and a pH of 4.6-5.8.

26. The method of claim 4, wherein the porous membrane is cleaned until the zeta potential of the porous membrane ceases to change.

27. The method of claim 4, wherein the time that the porous membrane is in need of cleaning is determined by the pressure drop across the porous membrane.

28. The method of claim 4, wherein the method further comprises determining the time that the porous membrane is in need of cleaning by determining the streaming potential or zeta potential of the porous membrane.

29. A method for producing beer comprising:

(a) filtering beer through a porous membrane that progressively clogs during filtration,

(b) monitoring the streaming potential or zeta potential of the porous membrane as a measure of the extent of clogging of the porous membrane,

(c) halting filtration of the beer through the porous membrane before the porous membrane becomes fully clogged as determined by the streaming potential or zeta potential of the porous membrane,

(d) cleaning the porous membrane, and

(e) then reusing the porous membrane to continue filtering beer.

30. The method of claim 28, wherein the filtration is halted when the streaming potential or zeta potential of the porous membrane is reduced to 20% of its original value for the unused porous membrane.

31. The method of claim 4, wherein the porous membrane is a polyamide porous membrane.

32. The method of claim 31, wherein the filtration is halted when the zeta potential of the porous membrane exceeds -5 mV as measured at pH 4.2.

33. The method of claim 4, wherein the filtering of the beer is cold-filtering of the beer.

36. The method of claim 29, wherein cleaning the porous membrane comprises contacting the porous membrane with a cellulase having a crystalline:soluble cellulase

activity ratio at 60 minutes of at least about 0.1 to clean the porous membrane.

37. The method of claim 4, wherein the porous membrane is a nylon-6,6 membrane.

38. The method of claim 4, wherein the porous membrane has a pore rating of about 0.02-1 μm.

39. The method of claim 38, wherein the porous membrane has a pore rating of about 0.1-1 μm

40. The method of claim 39 wherein the porous membrane has a pore rating of about 0.45 μm.

41. The method of claim 4, wherein the method further comprises pre-filtering the beer before filtering the beer through the porous membrane.

42. The method of claim 41, wherein the beer is pre-filtered through Diatomateous earth or a combination of Diatomateous earth and deep-bed filtration.